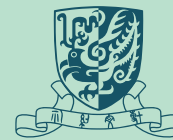


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Growth without Catching Up

*Organizational Dynamics in the
Restructuring of the Electronics
Industry in Hong Kong*

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Introduction

Earlier research on the phenomenal economic growth of East Asia has generated a complex literature, in which four major streams can be identified: free-market advocacy, statist approach, neo-modernization theory and global perspective (Chiu, Ho and Lui 1997:Chapter 1). Taking the region as a unit of analysis, adherents of the above strands each develop an "East Asian model" by searching for the "crucial similarity" among the four newly industrialized economies (NIE) through their respective perspective. First of all, free-market advocates, like Balassa (1988) and Friedman and Friedman (1980), highlight the well-functioning market mechanism where price signals allocate resources efficiently and effectively. Yet, this view is challenged by statist, including Johnson (1987), Amsden (1985) and Wade (1988), who stress that the state in these economies plays a much more active and extensive role in socio-economic transformation than free-market advocates assume. Beyond the market-versus-state debate are neo-modernization theorists, who embrace cultural categories, like Confucian heritage (MacFarquhar 1980) and family entrepreneurialism (Wong 1988). Meanwhile, the global perspective takes the "Asian miracle" as a restructuring of the international political economy during the post-war era (Henderson 1989; Dicken 1992).

Even though the literature has made a great contribution to the account of the East Asian development, its focus on the regional level obscures diversity among the four NIEs. The

aforementioned market-versus-state debate is illustrative enough: free-market advocates, like Milton Friedman, often highlights the case of Hong Kong, while statist like Johnson (1987) somehow ignores this former British colony. Disputes thus arise as to whether there is *one* development model in East Asia (see, for example, Dowling 1994 and Perkins 1994). When we shift our focus from industrialization to industrial upgrading, the diversity becomes even more apparent as to pose somehow inconceivable questions for the "East Asian model" literature as a whole.

Indeed, the diversity of the development experiences in the region has been increasingly recognized. The United Nations Conference on Trade and Development (UNCTAD 1996) compares the four NIEs on their export patterns over the three decades of 1963 to 1990, only to find Hong Kong to be losing its market share in almost half of the highly dynamic products in which it had earlier built a strong market presence. Chow and Kellman (1993) also offer a similar assessment: while all the four NIEs have successfully upgraded their exports from labour-intensive and resource-based to more technology-intensive products, Hong Kong nonetheless has the least structural transformation of commodity composition exports over the period from the mid-1960s to the early 1990s. With the other three NIEs having dramatically transformed their industrial base in one way or another (Mody 1990; Ernst and O'Connor 1992; Chiu 1994; Hobday 1995), it is puzzling that Hong Kong has stuck to labour-intensive manufacturing for three decades (Chiu et al. 1997).

In this paper, we shall add to this literature on the diversity of the East Asian experience by focusing on one critical Hong Kong difference from the other East Asian NIEs — its distinctive path of industrial restructuring since the 1980s by relocation rather than upgrading.¹ In the first section of this paper, we are going to use the case of the electronics industry to illustrate the general pattern of the manufacturing industry as a whole.² Being the largest manufacturing industry in the 1980s, electronics poses a crucial case to Hong Kong's upgrading performance vis-à-vis the other NIEs, both on its strength and weakness.³

To further unravel this paradox, in subsequent sections this paper then takes a fresh look at the development of the electronics industry from a historical and an organizational perspective. We shall argue that, in addition to the opportunities and constraints embedded in original equipment manufacturing (OEM), environmental imprinting on the internal organizational dynamics of the firm in the industry also matters. Our contention is that, owing to the dominance of the "sub-contractor model" in the development of Hong Kong industry, local electronics firms have early on developed a heavy commercial orientation in their organization and lack a drive towards product innovation. Analyzing the origin of firms clearly illustrates the "imprinting" effect of the organizational environment on internal organization. Furthermore, the persistence of the organizational model acquired during the formative period of the firm continues to shape its development during later periods. We shall also discuss briefly the role of the broader institutional context in sustaining the sub-contractor model at the expense of alternative paths of restructuring. In the last section, the experience of the electronics industry's restructuring will be revisited from this organizational perspective to highlight the significance of organizational dynamics in shaping Hong Kong's unique path to industrial development.

In Search of a Social-organizational Approach

As discussion of export-led growth highlights, a manufacturing firm in Hong Kong is often located in a buyer-driven global commodity chain (GCC), a network in which dominant overseas buyers (or producers) on the demand side determine what to produce by whom, and domestic manufacturers on the supply side in turn depend on these orders to continue their operation (Gereffi 1994a, 1994b; Gereffi and Korzeniewicz 1994). In other words, overseas buyers (or producers) control the critical resources which domestic manufacturers must acquire to survive. Under this light, the idea of "resource-dependency" — an organization is

always dependent on its environment for resources — thus provides one mechanism for the institutionalization and persistence of strategic orientations. According to Pfeffer and Salancik (1978; see also Salancik and Pfeffer 1977), a resource-dependence relationship has two important implications. First, control over critical resources provides external organizations with power over the focal organization; secondly, those who manage to acquire those critical resources for the focal organization have more control over intra-organizational process. The resource-dependence perspective offers a useful framework for organizational analysis, especially on the lateral dimension of power, i.e., power among functional departments (Boeker 1989; see also Perrow 1970; Fligstein 1990). As regards the question of who gets power in an organization, the resource-dependence perspective suggests that it should be the sub-units most capable of furnishing critical resources. While this seems common sense, Salancik and Pfeffer (1977) add that those who get power can hold onto it once they come into power, because “in organizations there are obviously opportunities for defining certain activities as more critical than others” (p. 9). Therefore, these sub-units may enhance their own survival through control over critical resources, placement of allies in key positions and definition of organizational problems and policies in line with their interest, capability and belief. This is to say, sub-unit interests may become institutionalized in an organization such that subsequent structural inertia may deter the organization from adapting to environmental change.

Resource dependence, however, does not exhaust the mechanisms through which the environment impinges on organizational orientation. In the language of neo-institutional organizational analysis, the process is analogous to the competitive or coercive pressures of isomorphism (DiMaggio and Powell 1983). Two other mechanisms, mimetic and normative isomorphism, are also ever present in an organizational field. Here we assert that environmental imprinting is also operative through the founder and founding process. Among various key actors in an organization, the founder is most often the one who defines the

organizational goal, and the top management is the group which runs the firm. Following March and Simon (1958), we argue that market signals are not always unmistakable to the founders or organizational actors; the founder is not a perfectly rational economic man with perfect information. This is to say that cognitive elements matter in decision-making such that people with different frames of reference will make different decisions even under an identical situation. “Satisfying individuals” with bounded rationality will thus always carry with them cognitive frames to help them make sense of environmental signals and internal problems.

The upshot of this point is that what constitutes the critical task for an organization is not so much a technical problem, but is rather subject to definition by power holders. Then, we should ask how do they define what problems the organization has to tackle. The resource-dependence perspective often inclines towards studying conditions currently faced by the organization, largely overlooking the historical dimension in general and entrepreneur influence at founding time in particular (Boeker 1989). Hence, Boeker highlights the founder’s past experience as influencing the form of the organization one creates:

It is likely that founding entrepreneurs will structure their organizations according to their own past experiences and beliefs. The founder’s past experience will help shape how he or she feels about the relative importance of specific functions to the organization. (p. 392)

In other words, there is no such thing as an economic man’s organization; we can understand a formal organization only by taking it as a social organization for which interactions with the environment and interactions among different social actors shape the way it formulates its organizational goals and strategies. By figuring out the context in which the founder starts the firm together with the interactive process by which the top management coordinates daily operation, we can make more sense of firm strategies. From this perspective, not only do external market

opportunity or pressure matter (i.e., mechanisms of resource dependence), but also the mediating role of the founding process will critically impinge on organizational development.

This imprinting process also generates path-dependence in the organization's subsequent development. As Stinchcombe (1965) argues, an organization's character is initially shaped by the historical conditions at the time of its founding, and once formed this character is likely to continue to exert a profound influence on subsequent behaviour. In other words, the effects of the environment at the time an industry and an organization emerge leave an enduring imprint on their objectives and strategies. Once external resource-dependence or cognitive models are institutionalized within the organization by the founder and the founding process, the strategic orientation becomes embedded in its routines and concrete practices and is reflected in the composition of its managerial stratum.

This paper therefore seeks to account for Hong Kong's peculiar upgrade trajectory by uncovering the historical-institutional context in which the collective preference for relocation over upgrading prevails. This path-dependence argument thus helps explain how an industrial firm may be trapped in a particular, sometimes sub-optimal, organizational form. When an entrepreneur starts a new firm, one organizes it in a way one *believes* would best achieve those critical tasks, thus setting an organizational form around which the firm evolves later on. Functional staffs whom the founder considers most capable of fulfilling those tasks gain power from the outset and, subsequently, stand a chance of extending their dominance in the organization by controlling the information flow, designing coordination routines, defining growth possibilities and/or formulating development strategies. As long as acceptable results are achieved, the entrepreneur (the top management) is likely to take the existing mode of operation for granted. With problems defined and solutions sought on the basis of this existing mode, the organization is set towards a path-dependent development.

The broader institutional context, such as the state, the capital market, the education system and the labour market, also generates pressure towards path dependence by "selecting" a dominant models of organization at the expense of other possible alternative forms. When we compare across economies, the institutional diversities are indeed remarkable. Hong Kong's unique institutional framework of industrialization has thus also contributed to its peculiar path of growth without upgrading over the past twenty years. In fact, the contrast between Hong Kong and other East Asian economies in this respect has been discussed on many other occasions, but here we hope to enrich this line of analysis by bringing the organizational level of analysis to the global and local context so that we can adequately understand the determinants of industrial restructuring in Hong Kong.

Towards a Typology of Business Strategies and Organizational Models

To summarize, we suggest looking into the evolution of an organizational field, which serves as a meso-level analysis that bridges the gap between the global level on the one hand and the firm level on the other. To make sense of the upgrade trajectory of a locality, we should examine how an organizational form comes to dominate an industrial field in the first place and how it sets the direction and pace for industrial development thereafter. To identify the dominant organizational form or business model, however, we need to construct a typology of the variety of these orientations in the field (Fligstein 1990).

The business orientation of each firm is often manifested in its choice of growth strategy during its formation years (see, for example, Boeker 1989 and Grove 1996). Among various orientations that may be found in an industrial field, we construct three ideal types with reference to the three functions that are key to any industrial firm (Perrow 1970), as listed in Table 1. First, the "research and development orientation" upholds constant research and ceaseless innovation, advocating research-driven strategies

Table 1 Three Ideal Types of Business Orientation in the Industrial Field

	Business orientation	Potential advocate	Strategic inclination
Research and development orientation	Constant research and ceaseless innovation	Adherent to the technology domain, likely to include people who are trained in engineering, science and/or other technical disciplines	Evolves around research activities, including basic research, technology application and product development
Sales and marketing orientation (Sub-contractor model)	Getting more products and/or services sold	Adherent to the market domain, likely to be those with sales and marketing experience and/or those from a trading background	Intends to increase sales by product differentiation, market diversification and the like.
Production orientation	Getting the production more efficient and less costly	Adherent to the production domain, likely to include those closely involved in the production function, e.g., industrial engineers, craftsmen and production managers	Aims at streamlining the production, for example, by automation, industrial engineering and vertical integration.

like research and development, product development and/or technology application as the best growth strategy. Adherents are likely to be those who come from the "technology domain," for example, those with formal training in engineering or science disciplines and/or those with a technical background. Secondly, the "sales and marketing orientation" advocates getting more products and/or services sold, embracing sale-led strategies like market diversification, product differentiation, etc. Adherents are likely to come from the "market domain" such as those with sale and marketing experience and/or those from a trading background. Thirdly, the "production orientation" aims to get the production more efficient and less costly, upholding such production-centred strategies as automation, vertical integration and/or industrial engineering. Adherents are likely to come from the "production domain," for example, former craftsmen, industrial engineers and factory managers.

In line with our intention to link firm strategies with the global business environment and the local institutional context, this paper is built upon data collected at various levels. First, we map out the upgrade trajectory of various electronics sectors in Hong Kong by making use of government statistics on industrial production and domestic exports over the past two decades. Secondly, to uncover the organizational ecology where we see the rise and fall of different organizational forms, we trace the growth trajectory of practically all listed electronics firms on The Hong Kong Stock Exchange (HKSE) by examining their initial public offering (IPO) documents and annual reports. Thirdly, to grasp the organizational process we conduct personal interviews with key executives of six local firms selected on a theory-driven basis.

Central to the understanding of the industry's peculiar upgrading pattern is the evolution — both homogenization and variation — in the organizational field. In an ideal world, either drawing on publicly available statistics or doing a survey would be sufficient. In fact, not only does the Hong Kong government maintain a rather narrow scope of industrial statistics, but Hong Kong industrialists never seem comfortable with responding to

survey research, especially when the questionnaire is long. To achieve our objectives, we therefore trace the growth trajectory of practically all publicly listed electronics firms on the basis of qualitative data that include the IPO prospectus, annual reports, newspaper reports and/or articles in books and journals. To categorize these firms into a meaningful typology, each case is coded according to such variables as founder background, business claim, business orientation, top management formation and competitive performance (see Wong 1999 for details on the coding scheme, the typology and data on each firm). The data set includes a total of 53 home-grown companies, deliberately leaving out those with a foreign origin and those entering the electronics field through merger.

Though the data set covers only a relatively small portion of the organizational field, it is an effective way to assess the likelihood of success and failure of different organizational forms in the electronics field as a whole. Not only does it uncover the persistence of qualitatively different organizational forms in the field, but it also makes a perfect control over the size effect on corporate success. As all companies in the data set have grown from a relatively humble to a well-established scale *en route* to public listing, the convergence of organizational features among these firms, if found, indicates which organizational form is the most likely to lead to corporate success in the field. To fill the gap between this 53-firm data set and the 800-strong electronics field, this study draws on various secondary sources ranging from academic studies, government-sponsored consultant reports, business journals to newspaper reports. After all, the data set is used to illustrate the organizational field and its evolution over the years, not to represent it.

Last but not least, we conduct in-depth interviews with key executives of six electronics firms in order to make more sense of firm strategies. With the six firms each selected on a theory-driven basis, interview data shed light on how organizational structure and dynamics vary to lead to diverse upgrade trajectories among Hong Kong electronics firms. As a small number of cases is

covered, we never mean to generalize a pattern from interview data. Instead, these cases are only used to make sense of the pattern we have identified through other data sources.

Hong Kong Electronics in Retrospect

The electronics industry was one of first movers in East Asia — by the late 1950s multinational corporations (MNCs) had started production in Hong Kong. The territory, if not a leader, kept up with the other three “small dragons” by the 1970s, only to lag behind in the regional race with the restructuring era in the 1980s. Quite a number of studies records a resemblance between Hong Kong electronics industry and its counterparts in East Asia until the mid-1980s (Ernst and O’Connor 1992; McDermott 1992; Hobday 1995). Labour-intensive manufacturing for consumer electronics is a common entry point: Hong Kong had been one of the world’s leaders in transistor radio assembly in the early 1960s, when electronics industries around the region were not much different.

The diversity became increasingly apparent only in the 1980s, a decade of economic restructuring when the emergence of new protectionism in the West together with the rise of new low-cost competitors in Asia force the four NIEs to reorient their development strategies (Chiu 1994). South Korea and Taiwan were subsequently found to be most effective in building a globally competitive electronics industry, but still Hong Kong was not that much behind by the mid-1980s in terms of both production value and technology level (Ernst and O’Connor 1992:95-180). However, Hong Kong stagnated as contract manufacturer mainly for consumer gadgets by the 1990s. Meanwhile, Taiwan has transformed itself into one of the market leaders in various high-technology segments, including notebook and desktop computers, optical scanners, multimedia cards or high-speed modems, to name but a few notable examples (*Business Week* 6 May 1996). Likewise, South Korea is not only a powerhouse in consumer electronics, but also

a key supplier of some critical components, including LCD (liquid crystal display) and CRT (cathode ray tube).⁴ In addition to product upgrade, both South Korea and Taiwan have made a bold step ahead in technology catch-up, for example, by developing locally a dynamic semiconductor industry (Hong 1992).

The difference in restructuring strategies helps explain the contrasting performance in industrial upgrading, as the four NIEs all respond to the challenge of economic restructuring by a combination of three strategies. The strategy set includes: first, expanding outward investment and relocating the production process to other developing countries; secondly, raising the level of regional integration in trade; and thirdly, increasing the value-added content of their exports and upgrading the industrial structure (Chiu 1994). Indeed, South Korea has shifted its emphasis from an "imitation" towards an "innovation" strategy by intensifying in-house research and development (R&D) (Kim 1997). Likewise, Taiwan has been so keen on acquiring cutting-edge capability in various technology areas that a globally oriented strategy is now a real possibility for a handful of firms (Lee and Pecht 1997). Even Singapore has developed locally a world-class engineering capability in spite of the predominance of MNCs, for example, as strong precision engineering industry is built up around the HDD (hard disk drive) sector (Wong 1996). Given Hong Kong's overwhelming reliance on the relocation strategy (Chiu et al. 1997), its failure to realize upgrade possibilities is not surprising.

Growth without Catching Up

Looking at the early 1980s, the Hong Kong electronics industry was found to have oriented itself towards consumer electronics, a direction opposite to that of Japan, South Korea, Taiwan and Singapore, among others, where high value-added sectors, such as computer, office automation and industrial electronics, had then been major growth areas (HKPC 1983). Indeed, the share of consumer products in Hong Kong electronics exports increased

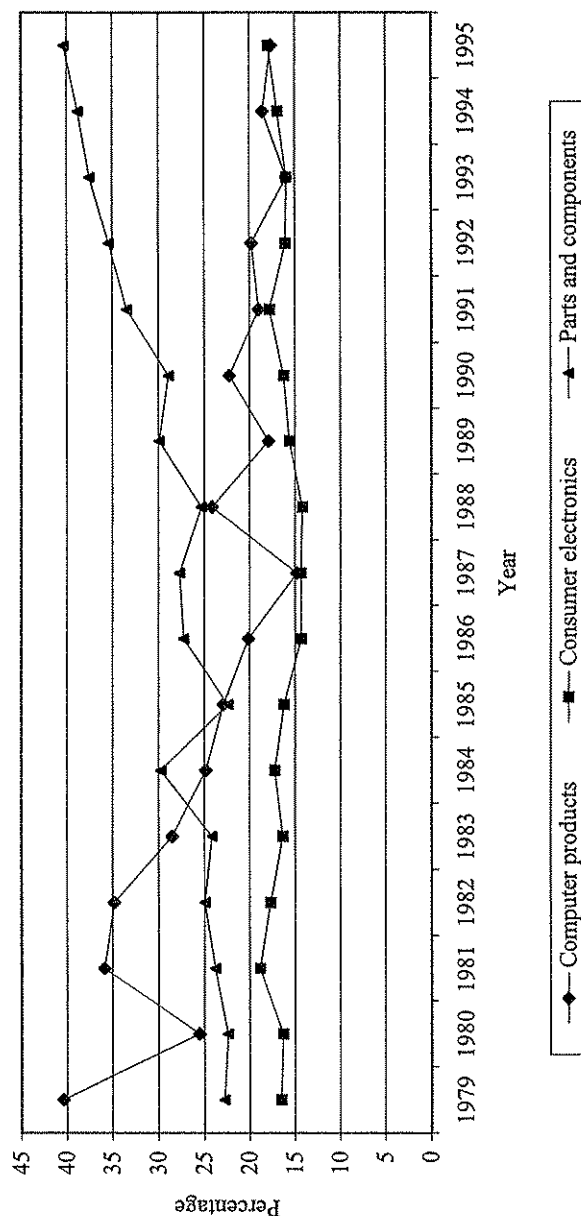
sharply from 52 per cent in 1974 to 71 per cent in 1980, and that of parts and components decreased from 48 per cent to 29 per cent over the period (ibid.:13-14). The trend persisted to make consumer electronics a consistent leader among all electronics sectors throughout the 1980s in terms of output, number of firms and employment.

As shown in Figure 1, consumer electronics constituted over 50 per cent of the industry's gross output throughout the 1980s, followed by parts and components, with computer products comparatively insignificant in that regard.⁵ Not until consumer electronics showed a sharp decline after 1988 did the other two sectors catch up slowly. But in terms of the number of firms, consumer electronics has not been challenged since the late 1970s, as Table 2 shows that the sector often exceeded and, sometimes, even doubled or tripled the sum of all other sectors in the period between 1979-1995.

The predominance of consumer electronics did not coincide with a better competitive performance. Quite the opposite, the sector was consistently weaker than the computer and component sectors in value-added ability, measured by value-added as a percentage of gross output (Figure 2). This explains why the HKPC (1983) discovers a plunge in value-added per unit sale in the electronics industry during its fast growth in the 1970s, with the figure falling to around 25 per cent of the output value in 1980 from an average of 30 per cent between 1973 to 1977 (ibid.:11-12). A much steeper drop in consumer electronics in the late 1980s in both gross output (Figure 1) and number of firms (Table 2) further demonstrates its relative weakness. By contrast, the component and computer sectors that both include comparatively higher value-added activities provided steadier employment during the 1980s; the computer sector even showed an increase in the number of firms.

Both the component and computer sectors have yet to claim a satisfactory competitive performance by international standards. The fact that Hong Kong electronics have long relied heavily upon imported parts and components illustrates the weakness of the

Figure 2 Value Added as a Percentage of Gross Output in Major Sectors of Hong Kong Electronics Industry 1979-1995



Source: Census and Statistics Department, *Annual Survey of Industrial Production*, various years.

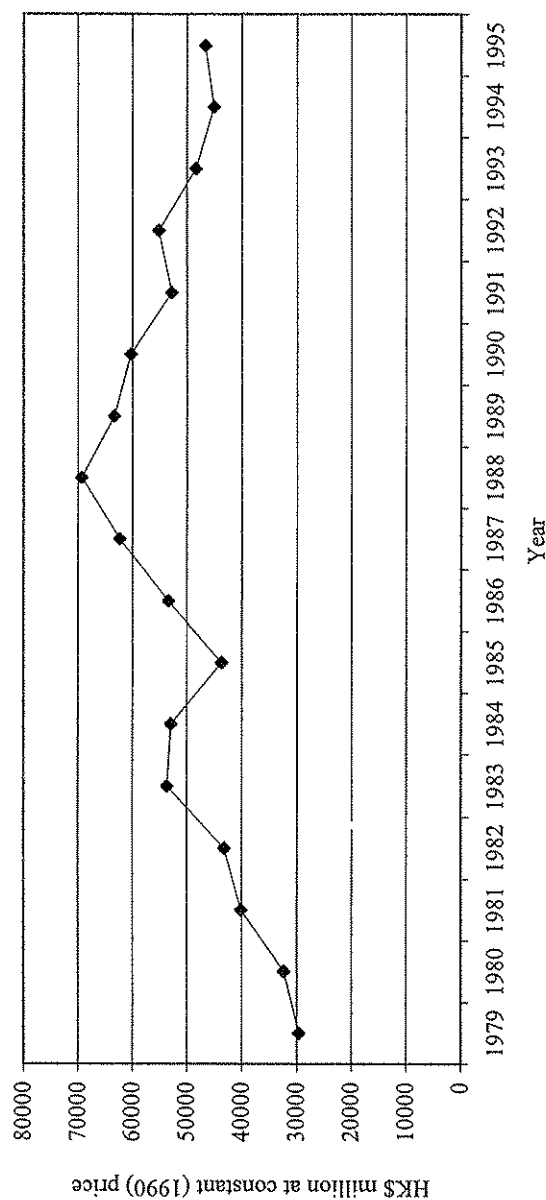
local component sector. Critical components often have to be imported from Japan, Taiwan, South Korea, the United States (US) and Europe, and less than half of the total purchased materials are composed of locally available parts (Dataquest 1991:IV-9). Likewise, the computer sector remains a junior partner in international trade (Boston Consulting Group International Inc. 1995:80-81).

All in all, the electronics industry as a whole failed to upgrade production as well as to catch up with its competitors during the 1980s. In 1989, average value added and output per worker of electronics manufacturing were US\$16.10 and US\$79.10, respectively, lagging far behind Singapore's level of US\$30.60 and US\$108.50 (Dataquest 1991). Squeezed by intensifying regional competition on the one hand and surging local costs on the other, the industry faced a downturn in gross output after reaching its peak in 1988 (Figure 3). A look at Figure 1 confirms that consumer electronics took the lead in the downturn, but statistics from Table 2 shows that both computer and component sectors did little more than postpone the decline of local production. Therefore, the early 1990s saw a constant decline of virtually all sectors in terms of gross output, number of firms as well as employment.

Entering the Made-by-Hong Kong Era

The sharp decline around the turn of the decade in a way reflects the failure of Hong Kong to catch up with South Korea, Taiwan and Singapore on the one hand and the intensifying competition from Thailand and Malaysia on the other (Dataquest 1991; Boston Consulting Group International Inc. 1995). Most important of all, the decline of local production is resulted from a collective strategy of the industry — production relocation in mainland China — in the face of a surge in local production costs in the mid-1980s. With most firms taking the relocation route instead of the upgrade alternative, offshore production multiplied at the expense of the local one in the 1990s, marking the era of "made by Hong Kong" (Berger and Lester 1997).

Figure 3 Gross Output of Electronics Manufacturing in Hong Kong at Constant (1990) Price, 1979-1995



Source: Census and Statistics Department, *Annual Survey of Industrial Production*, various years.

A study of industrial investment in the Pearl River Delta conducted by the Federation of Hong Kong Industries (FHKI) confirms the trend of relocation (Federation of Hong Kong Industries 1992). Almost 70 per cent (69.4 per cent) of the electronics establishments covered by the study have investment in the region (*ibid.*:63), with the average employment size of these relocated establishments being 905 persons (*ibid.*:69). In terms of investment, electronics firms in the Delta tend to concentrate in two clusters (*ibid.*:67). At the one end, there are small and medium-sized firms with capital size of less than HK\$5 million (39.2 per cent). At the other, there are larger firms with capital size of more than HK\$20 million (20.8 per cent). These findings suggest that the strategy of going offshore is by no means confined to larger firms. Given the geographical proximity of Hong Kong to the Delta, many small and medium-sized firms can "make use of the abundant supply of labor there to reduce production cost" (*ibid.*:67).

As a result, the Guangdong province has recorded spectacular growth in the electronics industry. Fueled by foreign investment, between 1986 and 1995 real output of the electronics industry under the purview of the Ministry of Electronics has grown by an average annual rate of 24.4 per cent to rise from RMB31,100 million to RMB247,100 million (*Chinese Electronics Industry Yearbook*, various years). The vast majority of the foreign-invested enterprises (FIE) in Guangdong are Hong Kong-based, as the Boston Consulting Group International Inc. (1995:10) estimates that Hong Kong-backed electronics enterprises account for 77 per cent of all electronics enterprises, or 83 per cent of all electronics FIEs in Guangdong. By the 1990s, therefore, the scale of Hong Kong-backed electronics enterprises in Guangdong has far exceeded those remaining in Hong Kong; that is why the Massachusetts Institute of Technology (MIT) research group calls it "Made by Hong Kong" (Berger and Lester 1997).

By moving their labour-intensive processes to mainland China, local manufacturers are turning their operation in Hong Kong into controlling headquarters (Chiu et al. 1997). R&D activities are mainly conducted in their Hong Kong establishments,

and more sophisticated processes are also retained in their Hong Kong premises while assembly is done in their offshore plants. Therefore, even the industry shows a sharp increase in the value added per person from the late 1980s onwards, we cannot conclude that Hong Kong has introduced systemic transformation in its industrial activities (cf., Census and Statistics Department 1993). Quite the opposite, the majority still remains largely OEM suppliers for overseas buyers (Industry Department 1994-1996; Hobday 1995; Berger and Lester 1997; Chiu et al. 1997; Enright et al. 1997). Given their business contacts with local sub-contractors and manufacturers based in mainland China, some Hong Kong manufacturers have even transformed themselves into traders and, in some other cases, assume just the role of a sourcing agent for transnational corporations (Berger and Lester 1997; Census and Statistics Department 1996). Even for those better-performing firms which have upgraded to original design manufacturing (ODM), their in-house design activities range only from hardware design to software programming, mechanical drawing, building prototype samples and tool-making. Only occasionally are they involved in industrial or conceptual design, while successful upgrade to own brand manufacturing (OBM) is even rarity (HKTDC 1997). Not surprisingly, Hong Kong's status as a cost-based competitor in the international marketplace remains unchanged, as Boston Consulting Group International Inc. (1995:199) puts it:

The Hong Kong domestic electronics industry is among the smallest in the region, and is the only one which has been contracting in real value over the past five years. In terms of capabilities, the Hong Kong industry is grouped with the new low-cost manufacturing bases in Thailand, Malaysia and China as a cost-based competitor with relatively few capabilities in product innovation and development. The other four industries in the region have, or are developing, capabilities at a much higher rate and face the future as value based competitors.

Inertia in Upgrading as a Strategic Choice

If Hong Kong had stagnated over the past three decades as a cost-based competitor in the international marketplace, it may well be the case that the territory has kept doing what it does best — international sub-contracting. Indeed, “local manufacturers have traditionally profited from moving quickly in and out of products and markets” (Dataquest 1991:IV-64). On the one hand, its strength lies in quick response to market changes — most producers can complete product designs in less than twelve months and produce from order to shipment in less than six months (Dataquest 1991:Appendix IV-15). On the other hand, they are more reliant on market intelligence than advancement in core technological development for survival, catching up with recent development of parts and components by acquiring them in the market instead of internalizing such processes of production (Chiu et al. 1997). With the constantly changing international division of labour offering ample opportunities in various market segments, Hong Kong just expands into the product lines given up by other advanced countries when the latter upgrade their product portfolio.

Underlying Hong Kong's excellence in international sub-contracting is a strategic preference for following in the rear over catching up with other rivals in the international race. An illustrative case of Hong Kong's preoccupation with the low-end market is the audio-visual (AV) sector, a consistent leader in the industry. Hong Kong started the assembly of the transistor radio in the late 1950s, making it the first Asian economy outside Japan to develop consumer electronics (Gregory 1985:12). Closely following the invention of the radio cassette recorder in the mid-1970s and the introduction of stereo systems in 1979, the Hong Kong's radio industry was in full swing in the late 1970s through 1981 when there were some 400 firms in the field (HKTDC 1984b). By the late 1970s, Hong Kong had even risen to share with Japan the leadership in the world's radio production by almost dominating the lower end of the market (Gregory 1985:9-13).

While Hong Kong was the first to benefit from Japan's upgrade from simple to multi-functional audio products, its propensity to catch up in the international race kept slowing as the latter moved further to such items as personal stereo, high-fidelity audio equipment, colour television (TV) and video-tape recorder (VTR). Therefore, simple radios — portable radios, clock radios and portable radio recorders — dominated Hong Kong's exports of AV products throughout the 1980s. Higher value-added items, including car audio, colour TV and video cassette recorder (VCR)/VTR never came close to even half of the export value of simple radios before the late 1980s.

While massive relocation had resulted in the decline of simple radios since the late 1980s, other product segments performed no better. By then, there was virtually no VTR manufacturer in Hong Kong, with only several TV manufacturers producing mostly 14-, 20- and/or 21-inch colour models (HKTDC 1990). The audio segment was a bit better than its video counterpart, with a few manufacturers already developing compact disk (CD) players in 1989 (*ibid.*). However, even when many manufacturers were capable of producing laser-based audio equipment by the mid-1990s, radio receiver was still the only AV product of which Hong Kong claimed to be the world's leading exporter (HKTDC 1997).

Even the local computer industry, commonly regarded as a high-technology industry, poses a similar case to the AV sector. Some local R&D projects on personal computers had already started in as early as 1978 (HKTDC 1984a), but this early effort won Hong Kong only a humble computer industry until the early 1980s. With the launch of the first IBM personal computer (PC) system in mid-1982 came the "PC revolution," and Hong Kong was again quick to capitalize on the growth opportunity to stake its position in the international marketplace by multiplying its exports in just a couple of years. In 1984, there were already 20 to 30 companies involved in the manufacture of PC (HKTDC 1984a). The fact that these manufacturers came from a diverse background ranging from audio product to electronic watch, even garment, demonstrated the flexible adaptation of Hong Kong

electronics to international market changes. Despite the fact that most of locally designed products fell into the low end of the market (*ibid.*:3), the territory did enjoy enormous growth throughout the 1980s as a follower in the rear. By the late 1980s, Hong Kong might even claim a healthy computer industry, producing both desk-top and lap-top PC systems, as well as all kinds of peripherals, including keyboards, monitors, disk drives, modems, memory cards, various add-on cards, even printers (HKTDC 1988).

Yet, Hong Kong never caught up in the technological race with the computer industry, following in the footsteps of the AV sector. As technological advancement dominated the multimedia boom in the 1990s, the territory could barely claim a steady business in parts and accessories and, to a much lesser extent, in peripherals. This assessment remains more or less valid even if we take the massive relocation into consideration, as local manufacturers are mostly engaged in production of computer parts and accessories, like motherboards, add-on cards, disk controllers, keyboards, multimedia cards, CD-ROM drives and game controllers by the mid-1990s (HKTDC 1997).

Apart from computers, the semiconductor industry also moved along the same trajectory. As in the case of consumer electronics, Hong Kong was the first Asian economy outside Japan to get into the semiconductor industry (Gregory 1985). In an attempt to defend themselves against Japanese rivals, US semiconductor manufacturers were led by Fairchild to seek cost-competitive production sites in Asia in the early 1960s, the first choice being Hong Kong, "the only location that then offered the essential conditions for a successful assembly operation" (Mackintosh Consultants Ltd. 1982:71). By the end of the decade, the territory had become the principal Asian assembler of semiconductor for the US market (Henderson 1989:98). In the early 1980s, three or four local firms had even acquired fabrication capability of up to four-inch wafers for LSI (large-scale integration) devices (Mackintosh Consultants Ltd. 1982:72). Indeed, the strength of the semiconductor industry in the earlier phase is shown by the fact that

even a very large part of these semiconductor devices were consumed locally, the annual export value amounted to no less than HK\$1,000 million throughout the 1980s (Census and Statistics Department, 1978-1996b).

By 1986, there were already 21 companies in Hong Kong engaged in the manufacture of semiconductors (of which six were locally owned), making the territory an emerging core of the regional division of labour in the industry (Henderson 1989:112). The 1990s indeed saw Hong Kong steadily expanding into testing and packaging activities, as reflected in the export value of mounted integrated circuits (IC). Another interesting fact was that, Vitelic of Taiwan and Motorola of the US formed a joint venture in Hong Kong in 1996 only to make memory ICs generations behind the technological frontier. It was to produce watch and clock ICs, voice and melody ICs and electronic toy ICs that had been fabricated locally for almost 20 years (HKTDC 1997). This is to say that the Hong Kong semiconductor sector was to remain only a follower at the rear, especially when we bear in mind the success of both Taiwan and South Korea in the technological catch-up.

These episodes all point to a strategic preference to international sub-contracting that Hong Kong electronics had been so consistently upholding over the past two decades (see also Chiu and Wong 1998 for a similar case in the LCD industry). The fast start in the 1970s demonstrates how effective the model is in the earlier phase of development, with the subsequent decline of local production just pointing to a systemic limit of cost-based competition. Interestingly enough, Hong Kong has survived the challenge not by industrial upgrading but, instead, by revitalizing the business model through massive relocation. Size counts, but not always, as the situation has lasted even in the "made-by-Hong Kong" era when the average scale has become much larger.

A look at the leading export items over the past two decades confirms the clustering of Hong Kong electronics around mature and/or fad products the profit margins of which necessarily stagnate, if not decline, as time goes on (Table 3). Notable examples

include LCD/LED watches and TV games through the late 1970s to early 1980s, telephone sets during the mid-1980s, video tapes in the late 1980s, radio telephonic receivers (including such telecommunications equipment as citizens band (CB) radios and transceivers) through the late 1980s to early 1990s, among a few others from the three product segments — AV, computer and semiconductor — we just discussed. Even the part and component sector follows a similar trajectory, as the early 1990s sees the rise of discrete components (static converters, rectifiers and transistors), printed circuits together with parts and components for radio frequency (RF) apparatus (i.e., TV and radio), audio equipment and telecommunication equipment.

While product upgrade is of a humble scale, process innovation and technology catch-up are more lacking. Dating back to the 1970s, when international sub-contracting emerged to dominate the field, the industry's expenditure on technology development (including product design and process improvement) was already little if compared to the large output and turnover. It was especially true in consumer electronics, as it is found that the whole sector spent only HK\$13 million in product design and process improvement in 1978 (HKPC 1983:32). Thus, the HKPC was right to suggest that "the industry has not been accumulating experience and know-how in technology development" (*ibid.*). The industry did not report satisfactory performance even in quality control, as one of the very few research reports done in the early 1970s with a focus on that production process in the electronics industry (Chiu 1973) discovered:

A large amount of effort and costs has been devoted to the prevention and internal failure sectors of the quality control exercise... sampling plans are determined subjectively and passively to meet the customer's need.... One can conclude from these figures that Hong Kong is not quite up to date in organizing Q.C. activities. (pp. 10, 15)

Table 3 Leading Domestic Export Items in Hong Kong Electronics Industry, 1978-1996

	1978	1981	1984	1987	1990	1993	1996
1st	LCD watch (1.88)	LED/LCD watch (4.27)	Computer parts (6.13)	Quartz analog electronic watch (7.07)	Quartz analog electronic watch (11.71)	Computer parts (12.12)	Mounted IC (12.06)
2nd	Portable radio (1.85)	Computer parts (3.09)	Quartz analog electronic watch (3.12)	Computer parts (5.38)	Computer parts (9.63)	Parts for RF apparatus (7.51)	Computer parts (7.22)
3rd	Clock radio (1.47)	Portable RCR (1.99)	LED/LCD watch (2.98)	Portable RCR (2.35)	Radio parts (3.22)	Electronic watch (6.97)	Electronic watch (5.80)
4th	Computer parts (1.33)	Portable radio (1.98)	Portable RCR (1.87)	Radio parts (2.30)	TV parts (2.56)	Mounted IC (6.70)	Part for RF apparatus (3.85)
5th	Portable RCR (0.99)	Clock radio (1.49)	Portable radio (1.82)	LED/LCD watch (2.29)	Computer system (2.37)	Printed circuit (2.58)	Printed circuit (3.23)
6th	Transistor (0.72)	TV game (1.46)	Telephone set (1.80)	Telephone set (1.78)	Mounted IC (1.95)	Cassette tape sound recorder for office use (1.67)	Cassette tape sound recorder for office use (2.02)
7th	Mounted IC (0.61)	Quartz analog electronic watch (1.28)	Radio parts (1.63)	Video tapes (1.47)	Printed circuit (1.92)	Parts for audio equipment (1.67)	Parts for audio equipment (1.95)
8th	Pocket calculator (0.60)	Mounted IC (0.86)	Clock radio (1.34)	Colour TV (1.45)	Radio telephonic receiver (1.85)	Transistor (1.46)	Transistor (1.87)
9th	TV game (0.49)	Cassette recorder (0.64)	Mounted IC (1.15)	Portable radio (1.33)	Static converters/ rectifiers (1.65)	Static converters/ rectifiers (1.38)	Other semiconductor device (1.44)
10th	Cassette recorder (0.47)	Electronic clock (0.59)	Computer peripheral (0.86)	Computer system (1.20)	Photocopying apparatus (1.55)	Parts for telecom equipment (1.23)	Parts for telecom equipment (1.26)

Notes: Figures in brackets denote the value in HK\$ billion at constant (1990) price.

RCR = Radio cassette recorder.

Source: Census and Statistics Department, *Hong Kong Trade Statistics*, various years.

Even a decade later, there was still a lack of awareness of quality control in most Hong Kong small and medium enterprises (SMEs) (Sit and Wong 1989:168-70):

For most SMI entrepreneurs, it is evident that much attention has been paid to new machinery as a cure for production and technological problems... their perspective on improving technology is very narrow.... When asked about their opinion on low cost automation, 2/3 of the sample firms claimed that they had not heard of it....

While Hong Kong manufacturers are supposed to prefer capital investment to other forms of process innovation, the performance of electronics industry through the early 1980s to the mid-1990s in gross addition to fix assets seems much less than satisfactory. It is again most evident in consumer electronics, which seldom invested more than 3 per cent of its gross output in fix assets (Census and Statistics Department, 1978-1996a). The computer sector is not much better, averaging an annual rate of just 3.39 per cent over the period.

Not surprisingly, a study report on industrial automation done in the early 1990s found Hong Kong electronics to be two to three years lagging behind Taiwan and Singapore to upgrade to SMT (surface-mount technology) by using automatic pick-and-place machines (HKPC 1992):

In the area of hard automation, the level of automation of Hong Kong electronics industry lags slightly below the optimum... on the whole, the industry invests in hard automation equipment if forced by their buyers, instead of continually seeking out opportunities to add extra value for, and hence extra value from, their customers. (p. 37)

Size limitation counts much less than management attitude in process upgrade of various types, as a major barrier to automation in Hong Kong is "the lack of appreciation of the contribution of manufacturing operations to the value-added of a business in industry" (ibid.:59). In a study on JIT (just-in-time) system where

Fong (1992) highlights the weakness of Hong Kong companies in inventory control, it is also found that management's misconception more than any other thing hinders Hong Kong's upgrade to a JIT system.

As in the case of process innovation, the intensity of technology innovation — usually carried out in a company's R&D section — is weak in Hong Kong (Reif and Sodini 1997). In fact, electronics firms have relatively weak R&D section. Chiu, et al. (1997) did a survey in the mid-1990s, just to find that more than two-thirds (73.9 per cent) of electronics firms employ no more than three R&D professional staff (p. 64). One may again be tempted to blame the limitation of SMEs, but even larger firms perform not much better in this regard. Just as Yu (1997) highlights: "large electronics companies in Hong Kong spent money on R&D mostly for the transfer of technology or for imitation, not for technological breakthrough or designing brand new products" (p. 125). Therefore, although Hong Kong has been quick to switch to CAD (computer-aided design) software in product design, the weakness in corporate R&D is so common that the electronics industry is still at its early stage in the application of ASIC (application-specific integrated circuit) (Industry Department 1991). Not surprisingly, Hong Kong has the lowest R&D spending among the four NIEs, estimated at 0.08 per cent of GDP in 1992 (Baker and Goto 1998:256).

The electronics industry had indeed thrived over the past three decades, with the 1970s being the take-off stage and the next two growing at a slower rate. Certainly a relatively small base helps record an explosive rate in the 1970s, but the slower growth thereafter cannot be explained merely by resorting to a larger base value. Indeed, the relative decline of industrial competitiveness is shown by the fact that Hong Kong's growth rate throughout the 1980s is much smaller when compared to what is achieved by South Korea, Taiwan and even Singapore over the same period (Dataquest 1991). The very fact is that, while Hong Kong's electronics has been renowned for its flexible adaptation to market change, the territory does little to transform its role in the global

division of labour as an OEM supplier in low value-added sectors even when possibilities for industrial upgrade become more abundant from the 1980s onwards. A look at the development of Hong Kong electronics industry since its very inception confirms the predominance of mature or fad products the profit margins of which necessarily stagnate, if not decline, as time goes on.

Indeed, Hong Kong's electronics is so attached to international sub-contracting that its lack of upgrading effort through process innovation or technological catch-up confines itself to the status of a follower at the rear. This is exactly why one may highlight flexible adaptation to frequent market change as a "Hong Kong advantage" (see, for example, Enright et al. 1997; Yu 1997), while others may just question whether a strategy of this kind is sustainable (see, for example, Berger and Lester 1997; Chiu and Wong 1998).

Dominance of the Sub-contractor Model among Large Firms

If on the whole the Hong Kong electronics industry can be characterized by the dominance of the sub-contractor model, one might wonder whether this is a result of the prevalence of small firms in the industry. After all, by the mid-1980s, only about 8 per cent of the industry were firms with 100 or more employees (Census and Statistics Department, 1978-1996a). Therefore, to control for the size effect, we examine the growth experience of the publicly listed company to see which set of business strategies characterize its growth history.⁶ To recall our earlier discussion, we categorize business strategy around the three functions that virtually all industrial firms perform, namely, sale and marketing, production, and research and development (Table 1). Although each of the 53 firms included in the data set certainly employs a combination of all three sets of strategy, it still makes sense to attribute the growth of a firm to one set as long as we can identify which one consistently figures prominently in its choice of growth strategy.

Consistent with our prior knowledge, the majority of electronics firms in Hong Kong travelled in the fast lane to success in the OEM marketplace: 30 out of the 53 listed companies thrived by applying the sub-contractor model (Table 4). Indeed, the pattern varies little across sectors, be it consumer electronics, personal electronics or parts and components. Their take-off follows their prompt response to surging orders from overseas buyers for certain big-hit items, for example, electronic watches from the late 1970s to early 1980s, LCD hand-held games in the mid-1980s, CD players from the late 1980s to early 1990s, and basic discrete components from the early to mid-1990s. Their continuous growth hinges on their fast moving in and out of the production of these items and, afterwards, on the ability to secure orders from current buyers and/or to search for new buyers.

In short, this typical path (what we called the sub-contractor model) to success exemplifies an orientation to grow by getting more products/services sold by strengthening market presence — sales and marketing orientation. The priority of sales and marketing strategy in this group is indeed illustrated by a functional integration in which the production function submits to a subordinate role as its R&D counterpart does. The fact that all those big-hit items rest on the low end to middle range of the market implies low entry barrier, thus intensifying competition as time goes on. But, instead of building their competitive edge on technological know-how, most of these firms just uphold such sales-led strategies as product shift and business diversification. Indeed, the R&D department in virtually all of these firms is weak and passive in that a common research practice is cooperation with existing/prospective customers in improving existing product designs and/or in developing other mature products. Seldom is it engaged in conceptual/industrial design, not to mention applied research in new technology. Although the production function often receives much attention because sales expansion requires parallel expansion in production, these firms seldom intend to build a competitive edge in the production sphere itself. Instead, they often stick to non-dedicated equipment

Table 4 Typical Path to Success of Companies with a Clear Inclination towards Sales Strategy in Hong Kong Electronics Industry

Sector	Companies	Typical path to success
Consumer electronics	Alco; Golden Power; Great Wall; Hannu; Hanwah; Kong Wah; Kosonic; Leading Spirit; Luks; Ngai Lik; Orient Power; Recor; Starlight; Tomei; Tomorrow; Wanon.	These firms usually start as a small factory concentrating on the assembly of simple consumer goods, transistor radios being the most notable example. Almost without exception, they rely on orders from overseas merchandisers. While their growth hinges on the ability to keep pace with these merchandisers in terms of volume, delivery and quality, their success usually follows a timely release of a big-hit item, for example, RCR in the 1980s, magnetic storage media in the late 1980s, and CD players in the early 1990s. Further growth is usually achieved by a combination of three strategies — sales expansion of current items, constant search for new buyers and hunting for next big-hit items.
Personal electronics	Kinson; Prod-Art; RJP; Same Time; Sharp Brave; Truly; Welback.	These firms usually start as a small factory engaging in the assembly of such items as calculators, hand-held games and electronic watches. Relying on overseas buyers in general and the so-called “gift market” in particular for orders, they are very likely to shift from one product to another. Their fast growth usually follows their quick move to tap into the enormous demand for fad products, for example, LCD hand-held games in the mid 1980s. In addition to the three strategies commonly used in consumer electronics, these personal electronics firms are more likely to assist price competition with product differentiation through cosmetic design.
Parts and components	AV Concept; Daiwa Associate; Honko; K&P; Man Yue; Wing Lee; Wong's International.	These firms either start as a trading house or as a small factory to serve local electronics firms. So, they usually concentrate on such basic items as printed circuit boards (PCB), capacitors, diodes, resistors, etc. Their growth is a result of two environmental factors: first, the expansion of local demand after relocation of other electronics firms; and secondly, the shift of market leaders towards more sophisticated parts. Their success hinges on a timely expansion of production volume to tap into the market demand, with typical examples being resistors, diodes and capacitors in the 1990s.

Sources: Company reports, IPO documents and news reports.

in order to be capable of shifting among a variety of electronics products. This sub-contractor model does not come as a surprise to most observers of the industry because the majority of the "successful" electronics firms in Hong Kong adopt exactly what we call the sales-led sub-contractor model.

Yet, quite a number of those who do not follow the dominant model also emerge, some of whom even demonstrating an outstanding competitive performance. In the remaining 23 companies for which we do not identify a clear inclination towards sales-led strategy in their path to success, eight leans towards production-centred or research-driven strategies, whereas the other 15 cases show somewhat ambiguous or mixed strategic orientation. With their different business orientation come alternative paths to success (Table 5). Unlike the majority whose success hinges on flexible adaptation to customers' changing requirements, these eight firms detach themselves from traditional/prevaling sales channels from the very beginning and build up their competitive edge around a core business *en route* to listing on the HKSE.

These firms have an exemplary record of product development and technological upgrading. Before Champion Technology invented its Chinese-language paging system, Group Sense applied the micro-processor unit (MPU) technology to its electronic translator and V-Tech released the educational computer, there were no such products on the market. Likewise, while such items as micro motors (in the case of Johnson Electric), liquid crystal display (Varitronix) and lead frames (QPL) are widely available, the three companies remain leaders in their respective fields by process upgrade and/or technological catch-up. This indicates that alternative upgrade trajectories and alternative growth orientations are indeed available in the Hong Kong electronics industry. Indeed, cases like V-Tech and Varitronix demonstrate how a technology-based firm can be organized around a research-driven orientation, whereas cases like Johnson Electric and Chen Hsong show how first-rate manufacturing can be build upon a production-centred orientation.

Table 5 Alternative Paths to Success in Hong Kong Electronics Industry

Companies	Major outlets during formation years	Constituents of success
Champion Technology	PTT in China	Invention of the first Chinese-language pager and paging system
Chen Hsong	Industrial market in Hong Kong	Concentration on the design and manufacture of plastic injection molding machines of "Japanese quality at PRC cost"
Group Sense	Retail market in Hong Kong	Invention of the first MPU-built electronic dictionary unit, marketed under the "Instinct Dict" brand
Johnson Electric	Industrial market in Hong Kong	Concentration on the design and manufacture of micro motors through intensive research in engineering
QPL	Industrial market in the Asia-Pacific region	Intensive investment in technology catch-up in lead-frame manufacturing and IC assembly
S. Megga	OEM for AT&T of the US	In-house development of Hong Kong's first cordless phones
Varitronix	Industrial market in Hong Kong	Concentration on the LCD marketplace through intensive research in technical know-how
V-Tech	Retail market in US	Relying on its specialization in MPU design to turn out brand-new products, like educational toys and cordless phones, sold directly in retail markets under house brands

Sources: Company reports, IPO documents and news reports.

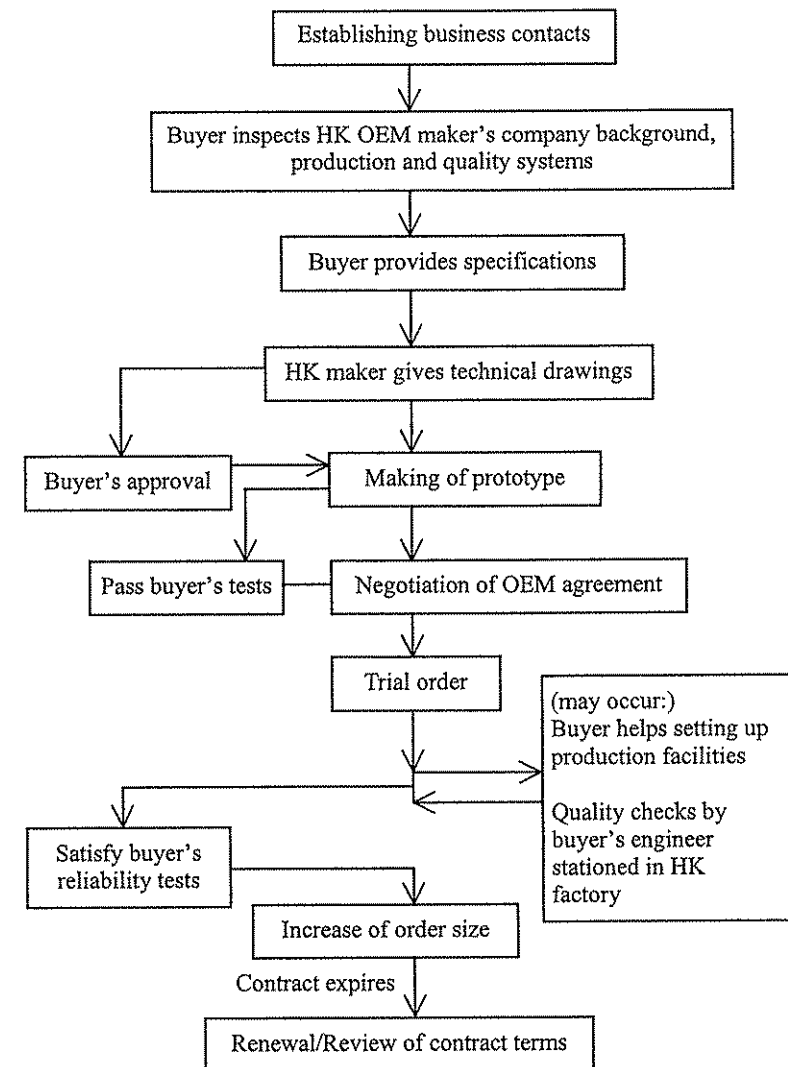
The Global Market and Persistence of the Sub-contractor Model

The presence of alternative models notwithstanding, it is the sales-oriented sub-contracting firms that come to dominate the organizational field. If Hong Kong gets locked into labour-intensive manufacturing through collective submission to the sub-contractor role in buyer-driven GCC, one begs to ask why this sub-contractor model is so pervasive and resistant to change. Unlike many other scholars who take Hong Kong's preoccupation with the sub-contractor role as something self-explanatory — there just exist many firms that are very well adapted to the sub-contractor role — this section will begin to uncover the lock-in mechanism. We will trace the emergence and persistence of the sub-contractor model in three steps. First, in this section, we will delineate how the GCC is likely both to induce the persistence of the sub-contractor model and discourage movements away from it. In short, the sub-contractor model is self-reproducing to a certain extent. Secondly, in the next section we will show how the early history of the industry helped institutionalize this dominant orientation in the founding process of firms. We will also see how the founders' background is also imperative in shaping the founding process and subsequent strategic development. Thirdly, the significance of the local institutional framework in shaping industrial development will also be delineated.

Buyer-driven GCC as Truncated Market

In Figure 4 that typifies an OEM arrangement, we see how unfriendly a business environment it is for local suppliers to upgrade their industrial activities. After all, a buyer takes overall control over allocation of resources across the business network by assigning what to be produced for whom. With virtually no control over how its products are distributed, a local supplier has no choice but limits its scope to contract manufacturing. While it may

Figure 4 Typical Procedures in Reaching an OEM Arrangement



Source: HKTDC (1991:7).

on occasion perform some product design for its buyers, production upon order more or less exhausts what it is supposed to do in such arrangement. This is why we call the buyer-driven GCC a truncated market: a buyer's control over the retailing end segregates suppliers from end-users; suppliers may never receive feedback from end-users, whereas end-users may never realize from which supplier their consumer goods come.

The weakness of local suppliers in marketing and the tight control of overseas buyers over distribution are just two sides of the same coin. Underlying this business arrangement is such power asymmetry that a buyer's approval is always prior to anything done on the part of a supplier (Figure 4), leaving most suppliers with few choices but to take buyer's order and sale forecast as the primary source of market information. An example is Lai's description of the procedure in his own firm, Fook Lung Ltd., a 500-staff clock radio maker for organizational buyers since 1982:⁷

Ever before we develop a new model, we gather information. This is very important, and we usually contact our existing customers and potential buyers for advice. Usually, before our customers come to Hong Kong to meet us we have already asked for their suggestions. Then we form a concept, draft drawings to see what is to be refined, and prepare mock-ups for their assessment. After their approval, we will go ahead for mechanical drawing and mold making.... This is typical of new product development procedure, in which buyers take a central role in providing information on market trends.

Information asymmetry of this kind helps explain why a local supplier is prone to get locked into the sub-contractor role. As long as a supplier takes buyers' orders as market demand and buyers' forecasts as market trends, these data restrict its operation to existing needs of its buyers, letting other business possibilities go unnoticed. Illustrative again is the case of Fook Lung Ltd., as Lai explains why the firm has never diversified away from clock radios:

We often look into the electronics field for business opportunities, just being unable to identify a target product. Diversifying into any product line may cause difficulty for our firm. Well, the problem does not lie in the product, but on market demand.... I often communicate with my buyers to see which product line to head for, just to be told "none." Therefore, we do what we have been doing well. That puts us in an advantageous position. We don't know how risky it is to diversify away; to stick to our own specialty is to play safe.

OEM as Steady Business

If power asymmetry in an OEM arrangement makes a supplier unlikely to upgrade its activities as long as a buyer gives no hint, it begs to ask why a supplier continues its engagement with such business arrangement. This leads us away from the constraining side to the enabling side of the business arrangement; while excellence in OEM may not lead a supplier to industrial upgrading, it is not quite the case in terms of corporate growth. Instead, a supplier who satisfy its buyers often ensures stable orders through their close ties, winning it much room for expansion (Figure 4).

Forming a long-term partnership with a buyer often wins for the supplier repeated orders of larger size and longer duration. This is attractive enough for many a sub-contractor, who are usually keen on forward planning to fully utilize their production capacity. As in the case of True Light, its emergence as one of the leading electronics groups in Hong Kong only followed its rapid expansion in the OEM marketplace throughout the late 1980s to early 1990s. In the words of Pang, its founder and chief executive:

Production relocation that facilitated expansion in production capacity was the turning point in our group's history. But what made us grow so fast was our ability to lure buyers who formerly went to South Korea and Taiwan. Their large and stable orders made it possible for us to steadily expand our production scale.

Long-term relationship with a buyer even helps an OEM supplier to outperform its rivals, as a few steps can often be skipped in establishing new order arrangements with old customers. Lai details the case of Fook Lung Ltd., one of the beneficiaries of long-term partnership with overseas buyers:

Backed by our long-term customers, we are assured of orders every time we release a new model even before we have our molds ready. This puts us in an advantageous position against many of our competitors, who have to seek orders after they have fabricated their molds. As for us, we can ask our customers to make orders just with a draft drawing, permitting us to go on to mold making at least with an order size of break-even level.

After all, a sub-contractor is reluctant to move away from the OEM role in buyer-driven GCC not only because of the power asymmetry but also because of the growth opportunities built in the business arrangement. But, as long as the OEM arrangement remains unfriendly to industrial upgrading, a local supplier may enhance its performance as an OEM supplier only at the expense of other possible tasks and, hence, become handicapped in capturing business opportunities outside the sub-contracting network. Dataquest (1991) points to Hong Kong's under-achievement in industrial design under the existing business arrangement:

Most of the respondents were involved in electronic system designs and the design of mechanical parts. In most cases, the designs were worked out according to the product specifications and product cosmetics provided by the parent companies or the customers. Only half of the respondents performed product cosmetic designs for some of their products, and design of tooling and molds were not widely provided by the respondents. (pp. IV-20)

In a sense, in the supplier-buyer relationship, an OEM supplier will have an incentive to upgrade only if its buyers prod it into doing so while offering support at the same time. While not impossible, this has not happened to a significant extent in the case

of Hong Kong electronics firms. What we have observed is that most OEM suppliers remain locked in low-end production throughout their entire organizational life span.⁸

Collective Attachment to the Sub-contractor Role

The foregoing analysis suggests that the more a sub-contractor leans towards satisfying a buyer's needs, the less likely it becomes capable of pulling away from the sub-contracting network. This helps account for Hong Kong's lack of industrial upgrading only if the majority of local firms do build their competence around the needs of their buyers. This reminds us of a number of scholars, who identify a peculiar business orientation that helps drive local manufacturers closer to the sub-contractor role (Chau 1993; Chen 1995; Hamilton 1997; Yu 1997). Among them is the pioneering study of Chau (1993), who typifies Hong Kong entrepreneurs as "merchant entrepreneur":

A merchant aims at securing income or wealth by the exchange rather than the production of goods... the process may involve fabricating or manufacturing. But if he has no interest in the commodity itself, or in the wants it satisfies; if the discovery excites him solely because of its profit potential, so that when the undertaking ceases to bring in supernormal profits he will not hesitate to dump the project, then he is what I call merchant entrepreneur. (pp. 23-25)

As regards personal and behavioural traits, a merchant entrepreneur is thus likely to be a non-specialist who adheres to a short time horizon with little commitment to any business line. This contrasts with an industrialist who "competes on the strength of the quality of his product, or on cost effectiveness... [and] takes pride in his product" (ibid.:25). In response to those who query why Hong Kong industries continue to specialize in labour-intensive products when "late-comers," like Korea and Taiwan, shift to more capital- and technology-intensive products, Chau simply replies: "This ceases to be a surprise if we know how the merchant entrepreneurs operate" (ibid.:27). In Hong Kong,

these merchant entrepreneurs thrive by their alertness to business opportunities such that they rush to the most popular products with low value added, low profit margins but a quick return. After all, two-thirds of the electronics firms covered by Yu's survey in 1994 have been and would continue to be OEM suppliers.

Organizational Imprinting of the Sub-contractor Orientation

While the linkages with the world economy via OEM production may have constrained local firms ability to move up the technology and value-added ladder by restricting the flow of information and incentives for upgrading, it is by no means the only nor the most important factor. For one thing, most NIEs started their industrialization via the OEM path, but comparatively the sub-contractor model has been most entrenched in Hong Kong. As noted earlier, the other three East Asian NIEs all experienced different degrees of upgrading. Why is this the case?

As we are about to show, organizational legacy matters a lot in selecting a group of industrializing agents whose attachment to OEM business is critical to the persistent prevalence of the "sub-contractor orientation" in the field. With the trading legacy came a far-reaching buyer/trader network that eased Hong Kong's insertion into buyer-driven GCC during the post-war era. Consequently, the manufacturing sector evolved around a buyer-driven, trader-mediated sub-contracting network in which local industrial firms could sell more products simply by getting more orders from overseas buyers and/or local traders. Thanks to this peculiar mode of industrialization in which a fast lane to success in international sub-contracting was available, the sub-contractor model outgrew other alternative business models in the industrial field by attracting hundreds of newcomers and spin-off firms to follow. With the majority of industrial firms being so attached to a business arrangement that was unfriendly, if not hostile, to con-

stant upgrading, it was no surprise that the electronics field failed to generate any systematic transformation over the years.

Traders as Industrializing Agents

Hong Kong was a colony built by the British as a trading port for their commercial penetration into the Far East. With the colonial legacy came an extensive institutional network for handling commercial transactions that not only contributed to the entrepôt development before the Second World War, but also served the needs of export-oriented manufacturing industries during the post-war era (Chiu et al. 1995). In particular, this network made Hong Kong a top candidate when mass merchandisers (i.e., department stores, large chain stores and supermarkets) in major North American and European markets looked for new sources for the most price-competitive consumer electronic goods in the late 1950s (Gregory 1985). This pre-existing commercial network basically paved the way for Hong Kong's smooth insertion into buyer-driven GCC.

Backed by a web of trading-related organizations, large overseas buyers could from the very beginning deal directly with some large manufacturers in Hong Kong. Moreover, the local trading community did play a vital role in match-making most local factories to overseas buyers during the early phase of industrialization (Espy 1970; see also Sit et al. 1979; Sit 1985). To illustrate this, we quote at length from Espy (1970), whose pioneering research about business strategies of Hong Kong's manufacturing sector turns out to be a rare documentation of this earlier industrial scene:⁹

Almost all of Hong Kong's export production is for buyers who represent manufacturers, wholesalers and retail chains in the market countries. The Hong Kong manufacturer is often simply a contract producer... production is almost always against firm orders, never for stock.... He is concerned only with finding foreign buyers who will give him contracts for producing items he is equipped to make.... If the buyer is experienced

and is placing a large order for one or several similar items, he will know which Hong Kong manufacturers are capable of filling his orders satisfactorily and can thus seek his own quotations.... Smaller buyers, especially those interested in a variety of different items, often find it to their advantage to channel their buying through the export buying office of a large British trading company such as Jardine-Matheson, Gilman or Dodwells.... There are several thousand trading companies in Hong Kong.... Most of these firms are owned and operated entirely by Chinese, but there are also Indian, Pakistani, American, British, Australian and Canadian companies offering buying services for overseas customers. (pp. 61, 63-64, 66)

In other words, Hong Kong's manufacturing industry has from the very beginning *evolved around a three-tier system in which overseas buyers give orders, traders make matches and factories perform production upon orders*. Under this system, most buyers are isolated from local producers, except that a handful of large overseas buyers maintain relatively close ties with renowned Hong Kong manufacturers. Usually, an overseas buyer sends a trade inquiry to a trading house, which then gets several quotations from local manufacturers (on a free-on-board basis) and submits to the buyer one quotation under its own name (on a cost, insurance, freight basis). If an order follows, the trading house places its own order with the Hong Kong firm and, then, assumes all responsibilities for inspection prior to packing, shipping, insurance and export documentation. Without these trading houses, it is hardly imaginable how small buyers from all over the world can make contact with thousands of anonymous factories in Hong Kong (Espy 1970; see also Sit et al. 1979).

The incorporation of Hong Kong's manufacturing into buyer-driven GCC through a trader-mediated network has in turn fostered the growth of sub-contracting firms by paving them a fast lane to success in the OEM marketplace. With abundant business opportunities spreading across the sub-contracting network, it requires little technical or business know-how for a sub-contracting firm to get more products/services sold by seeking more

buying orders. The only imperative to secure orders may well be the mastering of general-purpose production equipment that ensures flexible adjustment to customers' orders for a variety of products. This is indeed what Espy (1970) identifies as a common way to do business in the 1960s:

[F]inding foreign buyers who will give him contracts for producing items he is equipped to make. He wants contracts which are large enough to permit economical production quantities and provide the incentive and means to grow.... He is usually eager to obtain repeat business, as this requires a minimum tooling and employee training costs. These problems, rather than retail distribution or attracting consumers, are the major concerns of the Hong Kong manufacturer as he seeks orders from foreign buyers. (pp. 61-62)

The Rapid Rise of Sub-contracting Firms

The institutionalization of a buyer-driven, trader-mediated sub-contracting network symbolizes the evolution of the organizational field cultivating a business environment in which factories with a strong presence in that network are assured of corporate prosperity. For hundreds of small factories, securing a close tie with trading houses often makes them more viable than they would otherwise be (Sit 1985; see also Espy 1970; Sit et al. 1979). In fact, many local factories are so small that they even cannot arrange the clerical people to handle shipping, insurance and documentation; they just depend on trading houses as the major, if not the only, source of orders. In addition to managing export affairs, these trading firms sometimes offer substantial assistance to manufacturers whom they consider to be reliable suppliers, handling the purchase of raw materials and even arranging loans and machinery. As for large firms which usually do not depend on trading houses for orders, their growth hinges on an ability to maintain a close tie with overseas buyers. Therefore, a common feature among high-growth industrial firms during this early phase is that their chief executives personally conduct most

negotiations with their buyers, and many of them travel extensively to seek buyers in their market countries (Espy 1970).

As a result of the priority of business connections, those who have already been embedded in the sub-contracting network are even better positioned to seize business opportunities than technical and managerial experts are. It is evident in the 1970s, as Sit et al. (1979) report in their survey, that around 70 per cent of SME entrepreneurs set up their own firms after serving in the industrial sector and that 63.6 per cent of those in the electronics industry had their first job exactly in the electronics industry. Sit and Wong (1989) reaffirm the pattern in a survey done a decade later: "The typical pattern for about 80 per cent of the entrepreneurs is that they worked in one job, accumulating capital and know-how, before becoming employers" (p. 104).

In this sense, the sub-contracting network is built with a self-reinforcing mechanism: newcomers to the field are likely to join the sub-contracting business because of past experience in a sub-contracting firm. Though we can find no data to detail the background of these spin-off entrepreneurs, the priority of working experience over formal training in the likelihood of becoming an industrialist in Hong Kong does help spread the sub-contractor orientation across the field. After all, a salient feature of SME entrepreneurs in Hong Kong is their lack of formal training: around 70 per cent of all respondents have no formal training in either technical or managerial know-how; they only acquired this knowledge in their former jobs (Sit et al. 1979; Sit and Wong 1989). Without alternative tool-kits, these spin-off entrepreneurs are likely to enter the field only as followers of the sub-contractor model. On the one hand, the fact that 82.8 per cent of these SME industrial firms had an initial proprietor fund of no more than HK\$200,000 (Sit et al. 1979) implies that they had few choices but to join the sub-contracting network. On the other hand, it is hardly imaginable how small firms like these could have survived without trading houses performing an intermediary role between overseas buyers and small industrial firms.

With the institutionalization of the sub-contracting network in which insiders are most likely to start up an industrial firm, the sub-contractor model does not take long to become the dominant business model in the industrial field. After all, the Advisory Committee on Diversification (1979) notes that firm strategies had already converged by the late 1970s to govern Hong Kong's industrial development as a whole:

[E]ach industry includes a large number of small manufacturing establishments whose activities are largely responsive to buyers' orders. There is a lack of a reasonable number of large factories which have the capability and incentive to invest in the training of skills at various level, and in industrial support facilities and technical back-up services. (p. 75)

Founders and the Institutionalization of the Sales-led Organizational Form

In line with this peculiar mode of industrialization in which the sub-contracting network paved local industrialists a fast lane to success in buyer-driven GCC, the organizational form that best fulfills the sub-contractor role eventually prevailed in the field. There is indeed a "typical" path to success in the electronics field; the majority — 30 out of the 53 listed companies — travelled on the fast lane to success in buyer-driven GCC by adapting to the sub-contractor role. Of these sub-contracting firms (excluding two cases for which data on the founder's background are not available), all except three (25 of 28) had from the outset been embedded in the buyer-driven, trader-mediated sub-contracting network. Almost half of these firms were started as a petty workshop to serve the trader-mediated sub-contracting network (11 of 25). As for the rest, the founders all came from the market domain: they either had a trading background before stepping into the manufacturing field (9 of 25) or sales and marketing experiences in another electronics firm before spinning off (5 of 25).¹⁰

In contrast to the sales-led sub-contractor model whose founders have been embedded in the sub-contracting network, the alternative model has its founders detached from the market domain (Table 6).¹¹ In fact, five of these eight firms have their founders being trained as engineers: Champion Technology, Group Sense, QPL, S. Megga and V-Tech. As for the remainder, the founder of Chen Hsong was a mechanic, and the co-founders of Varitronix were both Ph.D. in physics. Whereas Johnson Electric was founded by a salesman in the late 1950s, the son of the founder — the company chairman at present — has joined the top management since getting a university degree in mechanical engineering in the early 1970s. From the outset, these firms have detached from buyer-driven GCC by starting their business either as an inventor of a proprietary product or an expert in a specific technology. Although the small sample size does not allow for rigorous statistical inference, the correlation between founder background and the strategic orientation of the firm is quite remarkable when we cross-tabulate the three types of firms with a dichotomized founder background (Table 6).¹²

Although alternative modes did exist, the dominant pattern of founding in the electronics industry had been spin-offs from the sub-contracting network. Coming into the new firm with plenty of experience of sub-contract manufacturing, these entrepreneurs

typically adopted an orientation towards growth characterized by getting more products/services sold through strengthening market presence — sales and marketing orientation. Indeed, the reliance on sale strategies varies little across sectors, be it consumer electronics, personal electronics or parts and components. The typical pattern: the initial take-off follows a prompt response to overseas buyers' surging order for certain low-margin, large-volume products, and continuous growth hinges on the ability to make product shift by seeking orders from current and/or new buyers. Notable examples of these big-hit products include electronic watches from the late 1970s to early 1980s, LCD handheld games in the mid-1980s, CD players from the late 1980s to early 1990s and basic discrete components from the early to mid-1990s. By contrast, in the remaining 23 firms that take alternative paths to success, eight cases lean towards either production-centred or research-driven orientation whereas the other 15 cases show a somewhat ambiguous strategic orientation (these alternative cases will be discussed in the next section).

Underlying the priority of sales-led strategies in the sub-contracting firms is a mode of functional integration in which the sales and marketing function takes the lead. Indeed, the R&D function in virtually all of these firms is so weak and passive that a common R&D practice is cooperation with existing/prospective customers in improving existing product designs and/or in developing other mature products. Seldom are they engaged in conceptual/industrial design, not to mention applied research in new technology. Even though the production function often receives much attention because sales expansion requires parallel expansion in production, it only submits to a subordinate role as its R&D counterpart does. In fact, these firms stick to non-dedicated equipment in order to be capable of shifting among a variety of electronic products, showing no interest in building a competitive edge in the production sphere itself. After all, these firms rely on sales and marketing strategies, like product shift and business diversification, largely overlooking the production and research

Table 6 Distribution of Firms by Strategic Orientation and Founder Background

Founder background	Strategic orientation		
	Sales-led	Mixed	Alternative
Marketing/Sales	25	4	0
Others	3	9	8
Total	28	13	8

Sources: Same as Table 4.

alternatives that could help alter their status as a follower at the rear.

Not surprisingly, the vast majority of these 30 sales-led sub-contractors remain OEM suppliers in buyer-driven GCC despite operating on a relatively large scale. Even though a few of them have turned into contract manufacturers for such electronics giants as Philips, Sharp and Sony, these better performers are still primarily engaged in low-margin, large-volume products, which those giants have totally or partially ceased producing in-house. Sounds similar, doesn't it? The growth pattern of these sales-led sub-contractors is just the mirror image of the upgrade trajectory of Hong Kong electronics industry — growth without catch-up. Hence, we approach a complete account of Hong Kong's peculiar upgrade trajectory by figuring out the organizational process by which their excellence in OEM develops hand in hand with inaction in industrial upgrading.

Institutional Context and Organizational Ecology

A third set of factors also contributes to the dominance of the typical sub-contractor model in the organizational ecology of Hong Kong's electronics firms: the local institutional framework of industrial development. The persistent presence of successful alternative organizational forms in the electronics industry demonstrates that historical conditions do not preclude the emergence of non-sales-oriented firms. Nor, as pointed out earlier, are global market constraints sufficient to account for the comparative absence of production or research-oriented models which are not so rare in other NIEs that also started as OEM makers. The situation in Hong Kong is puzzling when we bear in mind the global restructuring in the 1980s that should have provided research-driven and/or production-centred firms with ample business opportunities. To make sense of the lasting shortage of alternative organizational forms in the organizational ecology, we should turn to the institutional environment on which industrial firms

consistently draw resources for strategy formulation. While much has been said on the institutional configuration of a path-dependent development of Hong Kong's manufacturing as a whole (Chiu et al. 1997; see also Berger and Lester 1997), here we shall only account briefly for proximate institutions helping maintain the status quo by creating a resource differential in the organizational ecology. As we are about to demonstrate, since in Hong Kong the industrial sector as a whole faces a low supportive environment, sales-led sub-contractors are yet more likely to become beneficiaries than their research-driven and production-centred counterparts whenever institutional support is available.

Government Support for Industry

Government policy constitutes the single most important institutional force in sustaining the status quo in the organizational ecology, more because of its selective intervention into the industrial field than its adherence to free-market doctrine. While the government has long been renowned for its refraining from designing an industrial policy to alter the pace, direction and pattern of industrial development, it nonetheless has had an industrial policy of some kind. Unlike other Asian NIEs that follow a "top-down" approach to "pick winners," Hong Kong government just upholds a "bottom-up" approach to concentrate on removing obstacles to industrial and commercial investment (Tsui-Auch 1998). As a result, sales-led sub-contractors — "winners" in the "free-market" — often become primary beneficiaries of government support, further depriving research-driven and production-centred firms of their chance of challenging the majority status.

To look back, the government had often been responsive to the immediate needs of the majority in the manufacturing field. In the earlier phase, the predominance of trading-mediated manufacturing activities followed since the "certification of origin, participation in trade fairs, and trade publications more or less exhausted what the colonial state did to selectively promote

industrial growth" (Chiu et al. 1995:115). Likewise, the vast success of export-oriented manufacturing through the 1970s to 1980s paralleled a support system that evolved around the spheres of market promotion, trade facilitation and infrastructural support (Sit and Wong 1989). With the late 1980s to 1990s witnessing the massive relocation of manufacturing activities to China, emphasis even changed to the facilitation of entrepôt trade with China. In a survey of electronics firms in the early 1990s, industrialists regarded the Trade Development Council's service as the most satisfactory among different government agencies related for industrial development (Chiu et al. 1997). All in all, sales-led sub-contractors benefitted from their majority status to attract government support for their continual survival.

With the sub-contractor model absorbing most of the attention of the government, alternative organizational models have found their needs low on the priority list of policy makers. Of much relevance here is the lack of support for product/technology research and engineering-related activities (Berger and Lester 1997). For example, not until 1985 did the government grant \$8 million to establish the Hong Kong Design Innovation Company Ltd. to provide industry with product innovation and design services, not until the early 1990s were a handful of funding schemes set up to support technology-related projects (Director of Audit 1997), and calls for a science park and a NASDAQ-type second board lasted even for no less than ten years before the government took them into serious consideration in the mid-1990s.

All in all, local industrial policy helped sustain the status quo instead of offering a stimulus for systematic transformation. It is as much because of failure to push the majority to re-orient their growth pattern as it is the lack of selective incentive for alternative organizational models to start up. Not surprisingly, the colonial government set up a high-profile Advisory Committee on Diversification in 1977 to address concerns about industrial upgrading, only to leave many of the issues signalled at that time unresolved today (Berger and Lester 1997).

Capital Market

Despite Hong Kong's reputation as a financial centre, our industrialists seldom find easy access to financial sources in the local capital market, whatever banks, venture capital or stock market are in your mind (Berger and Lester 1997). While the "institutional separation of industry and finance" of this kind hinders upgrading strategies that require long-term, heavy capital investment (Chiu et al. 1997), the fact that trade credit has been a major source of external finance in the manufacturing industry has helped maintain the balance of power in the field. Indeed, sales-led sub-contractors are more likely to benefit from this financial service, as Bernard and Hallward-Driemeier cogently put it (1997:299):

If start up firms do seek external finance, they usually approach banks and are extended trade credit. Such credit is short-term — 90 days up to one year — and is secured by the receipts of the company.... The implications of this short-term loan structure varies across activities. For a trading concern with cash flow from the outsets of operations, rolling over this type of short-term loan may be feasible, due to the incoming revenues, and beneficial, as the firm can vary its debt obligations on short notice. On the other hand, a start-up firm, in software development for example, trying to turn an idea into a new product line typically experienced a lack of revenues at the outset which essentially cuts off trade credit as a source of financing.

That, once again, points to the advantages of being the majority; banks view more favourably those who concentrate on contract manufacturing for overseas buyers. Indeed, such a financial arrangement just fits in the work flow of a sales-led sub-contractor: they obtain necessary cash flow to maintain their operation after getting a confirmed order, and they just keep the cycle running by getting new orders after old ones are shipped. In contrast, for those who neither start nor operate their business upon confirmed orders, a research-driven firm for example, banks are unlikely to be a source of capital. In a capital market where neither venture capital nor a second board is available (Berger and

Lester 1997; Chiu et al. 1997), start-up firms that intend to apply alternative business models in Hong Kong have better ensure a quick return, or they risk running short of capital. However, both research-driven and production-centred firms are far less likely than sales-led sub-contractors to secure fast success. That is why we point out the capital market as another institutional force that sustains the prevalence of sales-led sub-contractors in Hong Kong.

Educational System

With the government taking a prominent role in education, it is not surprising that the educational system again creates a differential access to resources in the industrial field. Just as its counterpart in industrial promotion, government policy in education and training consistently follows a "bottom-up" approach. The Advisory Committee on Diversification (1979) pinpoints the foundation on which the government formulated its policy on education and training during the 1970s:

[I]t was the Government's responsibility to provide education whilst restricting itself to facilitating training.... Industry must accept the full cost of providing this element of training, whether it be given in industrial premises or in training centres built and equipped for the purpose. (pp. 219-20)

In other words, the educational system is not designed to become a stimulus to systematic transformation of the economy, not to say of the manufacturing industry. While the Hong Kong Productivity Centre (HKPC) was a prominent public body for industrial training during the 1970s, it offered training courses mainly in the areas of production management and labour supervision in the early 1970s (Sit et al. 1979:218). While the late 1970s saw the HKPC expanding its training courses to more specific fields, like management and technology, just more than half of its training activities benefitted the manufacturing industry, with the rest being absorbed by non-manufacturing sectors (ibid.:222). In-

deed, its operation on a self-sustaining basis even pushed the institution to deviate from its aims and objectives, i.e., "to promote the increased productivity of industry in Hong Kong and to encourage the more efficient utilization of resources therein" (ibid.:227).

Even though the government took up an active role in industry-specific training by setting up the Vocational Training Council in 1982, its approach remained more or less unchanged, resulting in a technical training system that was too passive to induce any systematic transformation. Throughout the 1980s, the industrial training system was by and large responsive to the immediate needs of prevailing activities, "emphasizing the operative, craftsman and technician levels of skills" (Sit and Wong 1989:67). The tertiary institutions, where the training of technologists level was done, did no better than provide general training for the business community as a whole. Indeed, a common complaint among Hong Kong industrialists was that "the universities hold themselves aloof from the industrial sector and do not tailor their teaching and research activities closely enough to its needs" (Berger and Lester 1997:66). As a result, not only did the educational system fail to supply personnel with a different perspective from the prevalent business model, but it also resulted in a lack of collaborative research projects between universities and industries.

Such an educational system certainly has quite different implications for different business models. For sales-led sub-contractors whose primary business objective is to secure orders for consumer gadgets, a steady supply of operatives and technicians from vocational schools, together with administrative and business executives from universities, may be sufficient. The shortage of expertise in industrial engineering and applied research does not hurt, nor does the lack of collaborative research between universities and industries. This is a totally different story for research-driven and production-centred firms; they find themselves in an environment where their core activities are hindered by the absence of a critical mass engaged in technology-related re-

search activities. In short, the educational system again poses an institutional force to sustain the status quo by depriving alternative organizational forms of the supply of appropriate personnel.

Labour Market

Of less significance among all four proximate institutions may be the labour market, but again we can regard it as another facilitating force for the prevalent model. The prevalence of sales-led sub-contractors benefits from a community-wide concern for low labour cost, with the industrial take-off going hand in hand with public subsidies for housing and medical services (Castells et al. 1990). The maintenance of low labour cost is such a legitimate concern that, even when industrial competitiveness aroused wide concern in the 1980s, much attention revolved around importation of foreign labour (Chiu et al. 1997; Tsui-Auch 1998). Not surprisingly, manufacturers who subsequently decided to relocate faced little resistance. While the weak unions set them almost completely free from interference in devising that strategy (Chiu et al. 1997), relocation was somewhat considered optimal by the authority. Just as the Director-General of Industry (1993) put it: "Hong Kong's proximity to China has rendered it possible to take advantage of lower land and labour costs in China. The shifting of labour-intensive industries to China has resulted in a leaner industrial workforce here.... This has helped to lessen the cost of production, thus maintaining the competitiveness of Hong Kong products" (p. 2). All in all, the labour market had been so arranged as to fit the needs of sales-led sub-contractors very much because of their majority status.

Restructuring of Handicapped Firms in Truncated Markets

The formation of sales-led sub-contractors is rooted in the peculiar mode of industrialization in which the sub-contracting network

takes charge. With the founders keen on capturing growth opportunities across the sub-contracting network, dealing with buyers is defined as the most critical task in these sub-contracting firms. As a result, functional staff that best serve this task — sales and marketing staff in most cases — take the lead in strategic formulation, information processing and inter-departmental coordination. As it turns out, these sub-contractors evolve around an organizational model that is set to excel in OEM — the sales-led sub-contractor model. What happened when this kind of firms encountered the challenges of the restructuring and changing business environment of the 1980s?

Whereas the earlier industrial phase in Hong Kong had seen most firms keen on making close contact with overseas buyers and local traders, the early 1980s also witnessed "a trend that makers nowadays prefer exporting direct to the buyers without going through trading companies" (*Electronics Components* 1982:334). For example, Lai, who founded Fook Lung Ltd. in 1982 after working in the electronics field for ten years, highlights the securing of buyers' orders as the most critical task during formation years:

When I set up the firm, there was difficulty securing orders. At that time, the rule is to do sales through a middleman [i.e., through local trading houses] and we follow suit. But we later realize that it won't work in long term and set up our own marketing three years later.... My experience in the field eases my contact with some buyers such that I can short-list them and call them accordingly. Since then we have shifted our focus from doing business through trading houses to direct sales to overseas buyers.

As long as the founder defines dealing with buyers as the most critical task in an organization, the sales and marketing function gains power over others. It is not only evidenced in small firms, like Fook Lung Ltd., in which the entrepreneur is preoccupied with the sales function, but also in relatively large groups. Of the 30 sales-led sub-contractors listed in the previous section, 12 of them have more than half of the executive directors with a

sales and marketing background.¹³ As for the other 18 cases, either the top management formation shows no clear inclination towards any of the three functions, or the company is basically managed by family members.

An illustrative case is True Light, a Hong Kong-based company with a 10,000-strong total workforce in Guangdong province. Even for this much larger firm which is organized in a multi-divisional form with much better integrated inter-departmental communication, executives with a solid background in dealing with overseas buyers are in charge in each of the four divisions. The explanation given by Pang, managing director, illustrates how the sales and marketing orientation prevails:

Business sense is the key asset in our group.... To survive, we have to capture the market trend to foresee best-selling products in years to come. Staffs who keep close contact with our customers are in the best position to do this, and so we have all of our division-in-charge with such experience.... They set the direction for the group just like what a captain does for a ship.

As a result of the dominance of sales orientation in strategic formulation, these firms lean towards business strategies that best suit the conception as well as the interest of the sales and marketing function, for example, market share expansion, product differentiation and market diversification. In fact, the overall inclination towards sales and marketing strategies in the electronics field not only emerged in the earlier phase of industrialization, when getting buyer's orders constituted the primary source of growth opportunities, but also lasted throughout the restructuring era when other business possibilities became abundant. Three surveys lend us strong support. First of all, Lin and Tuan (1989) find that diversification of production lines and product differentiation are the most popular strategies among local electronics firms, followed by diversification in overseas markets and developing new marketing channels. Secondly, Tuan and Ng (1995) discover that the major business strategies of

local electronics firms are "entering into new markets with existing products" (56 per cent), "increasing market shares in existing markets" (44 per cent), "developing new products for existing markets" (38 per cent), and "developing new products for new markets" (31 per cent). Finally, the Industry and Research Division of the Federation of Hong Kong Industries (1996), asked members to list expansion plans in specific functional areas; it found 52.2 per cent of the respondents picking marketing, followed by product design and innovation (35.8 per cent), research and development (32.8 per cent) and general administration (11.9 per cent).

The predominance of sales and marketing function in strategy formulation does not necessarily deter an industrial firm from industrial upgrading, but an orientation towards growth through getting more products sold in the OEM marketplace — a truncated market — does. With most firms directing their sales and marketing effort to lure organizational buyers, it is no surprise that Dataquest (1995) blames the weakness of Hong Kong electronics industry in both brand management and direct distribution on end-users:

In general, manufacturers took a passive approach in the marketing of their products or services. About 30 percent of the companies interviewed mentioned that the marketing was mainly handled by their own overseas sales offices/agents. The other marketing means practiced by the manufacturers include advertising in trade magazines, participation in exhibitions, direct contact with customers, and customers' reference... efforts spent in product market research and product marketing were minimal. (pp. IV-19-20)

An orientation towards strengthening one's presence in a truncated market explains a sub-contractor's lack of initiative in going beyond the OEM system. The leading role of sales staffs in these firms just pushes them closer to the sub-contractor role by building the organizational competence around the buyers' needs, as in the case of True Light:

Our marketing staffs serve as the primary collector of market information because of their close contact with our customers.... Usually, a new product development project is led by staff involved in business. After they formulate an idea or concept, they turn the project to the R&D team for further development.

Such a coordination routine — hiring R&D engineers to execute those projects assigned to them by sales and marketing staffs — blocks a sub-contractor from capitalizing on business possibilities other than contract manufacturing. As long as such sales domination lasts, any attempt to go beyond the existing operation is unlikely because sales staff who always eye existing business opportunities in the OEM marketplace can never get a sub-contractor out from its shell. Again, it is the case in True Light:

I don't think Hong Kong firms are able to do any invention, nor are we. What we can do is just to utilize proven technology for new product design, or we improve existing products with cosmetic design and add-on features.

It is therefore no coincidence that True Light reports an upgrade trajectory within the systemic limit of contract manufacturing as many better-performing local firms do, transforming itself from a mere OEM supplier of simple consumer gadgets for mass merchandisers into an ODM partner with world-renowned brand holders for higher-priced products. While these competent players in the OEM marketplace demonstrate impressive product upgrade by a careful selection of quality-conscious buyers, they seldom crave for a market niche of their own by in-house development of proprietary products, not to mention brand management and technology catch-up.

Structural Inertia in Sales-led Organizations

While an orientation towards more sales in the OEM marketplace deprives a sub-contracting firm of the motivation to go beyond the sub-contractor role, organizational practices that are so

designed as to excel in the sub-contractor role make the firm ill-equipped for many other high value-added activities. To illustrate structural inertia of this type, we provide evidence from a couple of cases that demonstrate how existing organizational practices constrain most upgrade moves, even if chief executives take strong initiative.

While a sales-led coordination routine may streamline the operation of an OEM supplier which aims to satisfy the needs of its customers, it inhibits in-house development of proprietary products. It is evidenced in the case of Innotech Ltd., a 500-worker firm which found its organizational competence accumulated during the OEM phase from 1985 to 1993 inapplicable in an attempt to introduce in-house developed products in 1993. As Lee, the founder of Innotech Ltd., discloses, what it takes to succeed in the OEM marketplace turns out to be so irrelevant to the business shift so that one has to build its R&D function from the ground up:

We had to build our R&D team from scratch, starting with only a few engineers who each handle a project independently. Only after a few years we built up a hierarchical structure headed by a chief engineer who oversees all projects.... In due course our OEM customers offer us no help at all.... Actually, the operation is totally different from OEM business in that we launch our marketing only after we complete the product development.

Not only was an incapable R&D function evidenced in a small firm, like Innotech Ltd., a listed group, like Faith International, also had a similar experience in its business shift. Even though the group had, since being established in 1978, grown into a leading calculator manufacturer, long-standing organizational practices were found useless when attempting to catch up in technology. Indeed, its shift to LCD manufacture by the early 1990s might have been impossible without an organizational restructuring, according to director Fong:

The calculator business requires no R&D at all, and we hire designers to carry out cosmetic designs suggested

by marketing staff after communication with customers. But it is totally different for the LCD line. Our R&D management team in Hong Kong is fully in charge of development projects under supervision of top management. They are active in absorbing technology through various channels like overseas visits and direct communication with suppliers.

To add all up, sales-led coordination that facilitates fast success in the sub-contractor role turns out to constrain both product development and technology catch-up. A shift away from the OEM role therefore requires a sales-led sub-contractor to exercise organizational restructuring through major reallocation of resources. Unless power holders in the firm perceive a crisis in their business and take strong initiative, any systematic transformation away from their existing operation is not likely, as Fong explains in the case of Faith International's move to LCD production:

OEM is a just dead-end road.... A turn to higher technology requires management to endure... we have to sacrifice short-term profit for long-term growth. We are quite lucky to be backed by the calculator business, but the STN LCD line would need more time to benefit the group.

Still, the structural inertia is so strong that failure is not improbable. In fact, the same year Innotech Ltd. started R&D on proprietary products, the company experienced the most serious business downturn in its history. Likewise, Faith International's continuous investment in LCD was only made possible by extracting resources from the calculator line that remained for years a stable source of profit. With high risks involved in such a big move, it is no surprise that few sales-led sub-contractors take an initiative to do so. In the final analysis, the path-dependent development of sales-led sub-contractors is as much because of their attachment to OEM as their inability to capitalize on other business opportunities.

Hong Kong's Upgrade Failure Reconsidered

From the foregoing discussion we make more sense of the lack of industrial upgrading in Hong Kong electronics industry over the past few decades. Whereas buyer-driven GCC recruited the vast majority of industrial entrepreneurs to the sub-contractor role in the first place, structural inertia among these sub-contractors helped maintain the status quo by making them reluctant to pull away from OEM business. The Hong Kong electronics industry has been locked into labour-intensive OEM not only because the environment has for so long fostered the predominance of the sub-contractor model, it is as well a result of the particular trajectories institutionalized early on in the organizational ecology. Owing to Hong Kong's early integration to the international trade and sub-contracting network, it is not surprising that the sub-contractor orientation was quickly institutionalized within the organization and diffused to the entire population ecology of organizations. Only by understanding the organizational dynamics of industrial development in Hong Kong, we can understand some of the peculiarities of restructuring since the late 1980s.

One might object to our somewhat pessimistic portrayal of the sub-contractor model by pointing to the fact that, if under a free market firms decide not to upgrade but rather to utilize the cheap labour and land across the border, this should be an efficient and rational outcome. While elsewhere we have pointed to the shrinking of the industry and its employment, free marketeers are still likely to retort by saying that it does not make sense to keep an industry and its workers if local production has already been losing its comparative advantage. In a free market, these workers will find work elsewhere anyway; if we look at the south China region, Hong Kong-owned industries are already employing millions of workers. On this point, we want to add another perspective to the discussion — the view from the firms' bottom line. Does the sub-contractor model perform better than the alterna-

tive? Of course, getting financial information on private firms is not easy, but making use of publicly available information from listed electronic firms, we can at least gauge the performance of the largest ones in Hong Kong.

In Table 7, we use four indicators to assess the relative performance of firms pursuing different kinds of strategies: total sales, net profit, the profit to sales ratio and the return to shareholder capital ratio. To iron out the effect of outliers, the median for each group of firms is reported. For listed companies, such information can be found in their annual reports and is collected in a locally published investment guide (Shi Jing Quan, various years). As before, we also classify electronics firms into three types: the ones adopting the sub-contractor model, the alternative model (research and production orientation), and the ones that exhibit a mixture of both models. It turns out that by both yardsticks the alternative model shows a much better performance. While local firms experienced a visible drop in all performance indicators from 1991 to 1998 owing to stiff competition and slow down in the market, the alternative model proved to be able to hold up to adversity a lot better than the others. Even the mixed model had better performance than the pure sub-contractor model. In 1998, firms adopting the sub-contractor model showed a dismal return to capital of only 0.8 per cent, suggesting that the shareholders would have earned better return had they simply put their money in a savings account! Hence, one can say that the trajectory by which the Hong Kong electronics industry has developed, that is, starting with the sub-contractor model and staying there even in the 1990s by relocation is not optimal, even for the firms concerned. Whether to stay in the sub-contractor model by choice or being constrained from pursuing the alternative, local firms appear to be jeopardizing their own bottom line and generating a rather disappointing return to shareholder capital.

Table 7 Median Financial Performance of Electronic Firms with Different Organizational Models, 1991-1998

	1991	1992	1993	1994	1995	1996	1997	1998
Net profit (HK\$ million)	23	37	56	31	23	24	25	5
	30	32	39	46	41	51	81	48
	74	100	133	156	201	250	280	159
Total sales (HK\$ million)	507	568	674	660	741	640	545	524
	339	362	555	631	709	698	599	652
	487	633	864	1018	990	1063	1130	1196
Return to shareholder capital (%)	11.5	12.1	11.2	3.7	3.3	3.3	3.1	0.8
	15.4	11.5	8.7	6.7	6.1	4.4	4.5	6.7
	13.8	16.1	12.3	10.6	6.7	12.6	12.2	9.7
Profit to sales (%)	6.5	7.3	6.1	3.5	2.9	2.1	2.5	1.6
	12.5	7.8	7.9	6.5	6.9	6.7	6.6	3.4
	20.2	24.3	24.2	20.2	9.3	17.1	15.5	17.4
N	7	22	23	24	26	28	28	29
	3	10	11	12	13	15	15	15
	3	7	8	8	7	8	8	8

Source: Shi Jing Quan, various years.

Notes

1. "Industrial upgrading" takes on a rather broad definition in this paper. This key concept comprises three aspects: (1) *product upgrade* means adding value to a product without altering the technological content, for example, by cosmetic design, brand development and quality approval; (2) *process innovation* means enhancing the production process without shifting the product line by increasing automation, introducing a new quality control system and redesigning the production system, to name but three; and (3) *technology catch-up* means approaching the world's technology frontier by acquiring a state-of-the-art technology, commercializing a new technology and so on. Taking industrial upgrading as a continuous process, this paper puts the question as how much upgrade a locality has achieved and in which aspect, instead of whether upgrade is achieved.
2. We shall define the electronics industry broadly as the sector that designs and/or manufactures electronic components and/or products containing electronic components. Not only does the definition ensure comparability, but its broadness is also justified on three grounds: (1) it captures the very nature of electronics firms in Hong Kong (and also in the region) that a clear-cut boundary can hardly be identified; (2) it includes a wide range of products to facilitate a study on industrial upgrading; and (3) it increases the diversity of the population to fit the research focus — the prevalence of a set of organizational characteristics across industrial sectors in a locality.
3. The outstanding performance of the electronics industry is a matter of consensus in Hong Kong. For example, Kwong et al. (1997) find it such among a few other industries that have significantly upgraded their technology amid massive relocation; Ng (1990) also highlights its remarkable improvement in productivity over the 1980s; and, the Census and Statistics Department (1997) even names it the best performer among

all manufacturing industries over the past decade in terms of labour productivity.

4. LCD serves the display function in a wide range of gadgets from calculators to lap-top computers, whereas CRT has so far been the prominent type of colour picture tube for television and computer monitors.
5. The Census and Statistics Department does not use such categories as we use in this paper. To facilitate sector analysis, *Consumer Electronics* includes "electronic toys," "electronic watches and clocks," "transistor radios," "television receivers and communication equipment," "sound reproducing and recording equipment and apparatus"; *Parts and Components* include "electronics parts and components"; *Computer Products* include "computing machinery and equipment"; *Office Automation Equipment* includes "office machinery and equipment except computing and accounting machinery"; and *Others* include those electronics products not elsewhere specified.
6. Due to the availability of data, we included 53 firms in the profile. As we aim to specify the set of business strategies that constitute the success of home-grown firms, foreign groups like China Aerospace, ASM Pacific, Legend and Pro-View are excluded. Also excluded are those that stepped into the electronics field through merger, notable cases being Semi-tech and Grande.
7. All company and personal names in this paper are changed to assure our interviewees of anonymity.
8. In the Hong Kong garment-making industry, such upgrading appears to be relatively more common. See Lai (1998).
9. As Espy did not single out the electronics industry in his study that covers only three electronics firms in a total of 27 cases, our paper does not intent to make generalization from his study.

10. Those started as a petty workshop include Kinson, Luks, Ngai Lik, Prod-Art, RJP, Recor, Same Time, Starlight, Welback, Wing Lee and Wong's International; founders with a trading background include Daiwa Associate, Great Wall, Hanny, Honko, K&P, Kosonic, Leading Spirit, Man Yue and Tomei; and founders with sales and marketing experience include AV Concept, Kong Wah, Orient Power, Sharp Brave and Truly. See Wong (1999) for details.
11. Due to space limitations, we cannot discuss these alternative models here. We are in the process of writing another paper comparing the different models. A discussion can also be found in Wong (1999).
12. $N = 49$ because founder background is not available for 4 of the 53 firms.
13. These 12 firms are AV Concept, Daiwa Associate, Golden Power, Great Wall, Hanny, K&P, Kinson, Leading Spirit, Orient Power, RJP, Tomorrow and Welback.

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Growth without Catching Up

Organizational Dynamics in the Restructuring of the Electronics Industry in Hong Kong

Abstract

In this paper we attempt to enrich the literature on the diversity of the East Asian experience by focusing on one critical difference between Hong Kong and the other East Asian Newly Industrialized Economies (NIEs) — its distinctive path, since the 1980s, of industrial restructuring by relocation rather than upgrading. By mapping the trajectory of restructuring in the electronics industry, in the first section of this paper, we are going to use it as a critical case to illustrate the general pattern of restructuring in the manufacturing industry as a whole. To further unravel this paradox of growth without upgrading, in subsequent sections of this paper we take a fresh look at the development of the electronics industry from historical and organizational perspectives. We will argue that, in addition to the opportunities and constraints inherent in export-oriented original equipment manufacturing (OEM), environmental imprinting on the internal organizational dynamics of the firms in the industry has also had an effect. Our contention is that because of the dominance of the "sub-contractor model" in the development of Hong Kong industry, local electronics firms have developed a heavy commercial orientation in their organization, and lack a drive towards product innovation. Furthermore, the organizational models acquired during the formative period of the firms has continued to shape their development during the later periods. Analyzing the origins of firms clearly illustrates the "imprinting" effect of the organizational environment on internal organization. We will also discuss briefly the role of the broader institutional context in sustaining the sub-contractor model at the expense of alternative paths of restructuring. In the last section, the experience of the

electronics industry's restructuring will be revisited from this organizational perspective to highlight the significance of organizational dynamics in shaping Hong Kong's unique path of industrial development.

香港電子工業轉型之組織面向

趙永佳
黃家松

(中文摘要)

本文以電子工業為個案，嘗試探討香港與其他東亞地區於工業轉型的異同。本文指出，香港電子工業以大規模外移而非技術升級的轉型策略之歷史及組織因素。主因是在電子工業發展初期，「外判型」經營模式在電子業佔了主導位置，引致廠商經營上帶有濃厚商業色彩，而缺乏內部技術提升之動力。分析成功大型企業之成立背景亦可以推斷外部組織環境也對企業之內部結構有所影響。

宏觀制度因素亦使到主流之組織型態得以長期延續下去，並塑造了香港工業轉型之獨特型態。